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Analgesic Use for Dental Pain: Knowledge, Awareness, and Practices among Patients in Northern Jordan

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ABSTRACT

Objectives: Dental pain is a common reason for self-medication with over-the-counter (OTC) analgesics, which may delay definitive care and expose patients to avoidable risks. Evidence from Jordan on analgesic use specifically for dental pain, and how this varies by sociodemographic factors, remain limited. This study aimed to evaluate the knowledge and awareness of dental patients regarding the use of analgesic medications for dental pain.

Materials and Methods: A cross-sectional survey was conducted among adult dental patients. A self-administered online questionnaire assessed sociodemographic characteristics, practices, and knowledge related to analgesic use for dental pain. Descriptive statistics were calculated, and associations between sociodemographic variables and knowledge, beliefs, and behaviours were examined using Pearson's chi-square test ($p < 0.05$).

Results: A total of 480 participants completed the survey. The most commonly used agents were acetaminophen (48.3%) and NSAIDs (33%). In total, 41% reported dentist-prescribed analgesics, while 35.8% used non-prescribed agents. Around a half (50.8%) reported justifiable use, whereas 16.7% reported unjustifiable indications. Most participants demonstrated adequate knowledge: 59.4% disagreed that all analgesics are safe, 76.3% disagreed that they are universally safe in pregnant or breastfeeding women, 64.2% recognized potential drug interactions, and 78.5% correctly identified analgesic medications; 54.4% correctly identified codeine/tramadol as dependence-causing. Female gender, higher education, medical employment, middle income, and health insurance were all significantly associated with higher knowledge scores and safer beliefs.

Conclusions: Dental patients in northern Jordan show generally good, but uneven, knowledge and practices regarding analgesic use for dental pain. Sociodemographic factors, particularly gender, education, employment in the medical field, income, and insurance status, significantly shape analgesic literacy and behaviour. Tailored education delivered through dentists, pharmacists, and other healthcare providers is needed to address persistent misconceptions, especially around pregnancy, drug interactions, and dependence to promote safer and more rational use of analgesics.

Keywords: Analgesics, Pain management, Dental clinics, Nonprescription drugs, Health knowledge, Attitudes, Practice.

1. Introduction

Dental pain is among the most prevalent oral symptoms, frequently presenting in dental practice (1,2).

Whether pulpal, periapical, periodontal, or musculoskeletal in origin, the successful management of dental pain requires addressing the underlying

pathology (3). However, many patients resort to self-medication for temporary relief, a practice that can mask disease progression, cause adverse effects, and delay appropriate treatment (4). Consequently, analgesics emerged as the most frequently self-medicated drugs in dentistry, reflecting their perceived safety and widespread availability (5). In dental practice, commonly used analgesics include paracetamol (acetaminophen), aspirin, and nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen, all of which are effective when appropriately used (2,6). Evidence from the American Dental Association (ADA) confirms that preoperative administration of acetaminophen (1 g) or aspirin (1 g) can significantly reduce dental pain compared with a placebo (7). Nevertheless, the convenient availability of over-the-counter (OTC) medications has contributed to inappropriate use. Studies reported that more than 80% of dental patients self-administer analgesics, and nearly one in ten exceed the recommended dosage, exposing patients to hepatic, renal, and gastrointestinal toxicity (1,3,8,9). However, patterns of analgesic use for dental pain vary widely across countries and regions, reflecting differences in socioeconomic conditions, education, cultural norms, healthcare access, and awareness of medication safety (4,10). In Tanzania, for instance, nearly 98% of participants used self-prescribed analgesics before seeking dental care, with no significant differences across age, gender, or education levels, suggesting a community-wide behaviour rather than one driven by sociodemographic factors (11). In contrast, data from Canada revealed a strong socioeconomic gradient: use of non-opioid painkillers was linked to higher income, better oral health, and more regular dental visits, whereas lower household income correlated with a preference for prescription opioids (12). Similarly, in Nepal, 43.3% of respondents engaged in self-medication for dental problems, and this practice was significantly associated with lower family income and limited access to formal dental services (13). Collectively, these findings suggest that while analgesic use is widespread, the social, cultural, and economic drivers underlying this behaviour vary considerably.

According to a recent systematic review encompassing 34 studies from 13 countries across four continents, the global prevalence of self-directed medication for dental conditions averaged 72%, with the highest rates observed in Africa (81%) and the lowest in

Asia (67%). The review identified female sex, younger age, and educational level as recurring predictors, and highlighted a general lack of knowledge regarding appropriate drug use, dosage, and adverse effects (4). Interestingly, a study in the United Arab Emirates reported that nearly a half of those practising self-medication held higher education degrees unrelated to the medical field, suggesting that formal education does not necessarily translate into appropriate medication awareness. The most common reasons were time constraints preventing dental consultation and the perception that dental problems were not serious, reflecting a broader tendency to prioritize symptom relief over professional care (5).

In Jordan, national studies have similarly documented self-medication practices and knowledge involving OTC drugs, particularly analgesics. A 2020 cross-sectional survey found that 50.4% of participants used analgesics without prescription, with 63.1% recognizing that not all OTC medications are safe (14). However, a more recent study reported higher levels of misuse, with 56.9% of adults using medications without a prescription, 72.4% admitting to exceeding the recommended dose at least once, and over a half experiencing side effects (15). Despite documenting similarly high rates of analgesic use, these studies reported inconsistent findings regarding public knowledge and awareness, leaving uncertainty about how Jordanians understand and use OTC drugs. Moreover, both studies examined analgesic medication in general rather than dental-specific pain management.

Understanding how dental patients select, dose, and perceive analgesics is essential for identifying misconceptions that may contribute to inappropriate use or delayed dental care (4). Unlike previous Jordanian studies that examined over-the-counter medication use in general populations and across mixed indications (15,16). The present study focuses specifically on analgesic use for dental pain, a context in which self-medication is particularly common and clinically consequential (1,3,5). Moreover, this study aims to provide a comprehensive sociodemographic analysis, exploring associations with age, gender, education, income, and marital status, factors previously shown to influence self-medication behaviours in other settings but inconsistently examined within Jordanian populations (4,10-13). By targeting patients actively attending a dental teaching centre and examining dental-

specific pain management practices, this study offers novel, context-specific evidence that addresses gaps in the existing Jordanian literature and supports the development of targeted public health interventions aimed at promoting safer and more rational analgesic use in dental settings.

2. Methods

2.1 Study Design and Setting

A cross-sectional study survey of dental patients attending the dental teaching centre in Irbid, Jordan, was conducted using an online questionnaire. The questionnaire was built based on available literature examining the knowledge and awareness of the irrational use of analgesics (2,17,18). Twenty participants completed a pilot test to evaluate the clarity and validity of the questionnaire. Based on their feedback, the questionnaire was revised and improved accordingly. Eligibility criteria for participants included being 18 years or older and the willingness to participate voluntarily with informed consent. The study population included dental patients attending the Dental Teaching Centre in Irbid, Jordan. The data-collection period was from November 2023 until February 2024. The Raosoft online sample size calculator was used to calculate the sample sized (19) (<http://www.raosoft.com/samplesize.html>). Based on a 95% confidence level, a 5% margin of error, and a 50% response distribution, the minimum required sample size was 384 participants. The sample size obtained in this study was 480.

2.2 Survey Instrument

Data was collected using an online self-administered questionnaire distributed to patients via electronic invitations on social media platforms (e.g. WhatsApp, Instagram and Facebook). A brief description of the study was provided for the participants. The questionnaire was translated in accordance with established cross-cultural adaptation guidelines, a process shown to maintain construct validity and reliability in health-survey research (20,21). As a result, the Arabic and English versions were regarded as equivalent, minimising the risk of language-related measurement bias.

The questionnaire consisted of 11 items and was divided into three sections. The first section collected sociodemographic information, including age, gender, marital status, educational level, income, employment

status, and health insurance (8 items). The second section assessed practices and patterns of analgesic use for dental pain, including frequency of use, source of prescription, information sources, type of analgesics used, experience of adverse effects, and indications for analgesic use (6 items). The third section evaluated participants' knowledge and perceptions regarding analgesic use, including safety, drug interactions, identification of analgesic medications, and awareness of dependence potential (5 items). Knowledge regarding analgesic use was assessed using five questions addressing key safety issues. These included beliefs about whether all analgesics are safe to use, whether analgesics are safe during pregnancy or breastfeeding, awareness of potential drug interactions, ability to correctly identify analgesic medications, and knowledge of which analgesics may cause dependence.

The internal consistency of the scale was assessed using Cronbach's alpha, which demonstrated good reliability, with a Cronbach's alpha coefficient of 0.7.

2.3 Eligibility Criteria

All Jordanian patients aged 18 years or older attending the dental teaching centre during the study period were eligible for inclusion, provided they consented to participate voluntarily, regardless of the type, severity, or chronicity of their dental complaint. Ethical approval was obtained from the Institutional Research Board to collect participants' data.

2.4 Data Analysis

Data was exported as an Excel sheet from Google Forms, then refined to be used by IBM SPSS Statistics, V23 for data analysis. Descriptive statistics were employed to estimate the prevalence of analgesic use-related knowledge, attitudes, and practices and Inferential analyses using chi-square tests, with a p-value <0.05 indicating statistically significant were conducted as exploratory assessments of associations between categorical variables.

3. Results

3.1 Sociodemographic Characteristics of Study Participants

A total of 480 responses were collected, from which 300 were from females (62.5%), and 180 (37.5%) were from males. The majority of respondents were single (258, 53.8%). Regarding residence, 375 (78%)

participants indicated living in the urban areas of Jordan. The age distribution showed that the largest group of participants was between 18 years and 25 years of age (197, 41%). Regarding educational attainment, the majority of participants held a bachelor's degree, comprising 366 (76.3%), while only 54 participants (11%) completed their education up to the high school level. Employment status revealed that a significant proportion of respondents were unemployed, with 268

participants (55.8%) reporting no employment. In contrast, 55 participants (11.9%) were employed in the medical field. Monthly income data indicated that the most common salary range for participants was between 500 JD and 1000 JD as reported by 143 participants (29.8%). Health insurance coverage was prevalent, with 375 participants (78%) confirming that they were medically insured. Table 1 describes the demographics of the study participants.

Table 1: Demographic characteristics of the study participants (N = 480)

| Variable | | Frequency (n) | Percent (%) |
|---------------------------------------|----------------------|---------------|-------------|
| Marital status | Single | 258 | 53.8 |
| | Married | 222 | 46.2 |
| Gender | Male | 180 | 37.5 |
| | Female | 300 | 62.5 |
| Place of living | Urban | 375 | 78.1 |
| | Rural | 105 | 21.9 |
| Age (years) | 18-25 | 197 | 41.0 |
| | 26-35 | 89 | 18.5 |
| | 36-45 | 84 | 17.5 |
| | over 45 | 110 | 23 |
| Education level | Up to high school | 54 | 11.3 |
| | Bachelor's degree | 366 | 76.2 |
| | Postgraduate studies | 60 | 12.5 |
| Employment status | Unemployed | 268 | 55.8 |
| | Employed (non- | 155 | 32.3 |
| | Employed (medical) | 57 | 11.9 |
| Salary/month (Jordanian Dinars) | <300 | 72 | 15.0 |
| | 300-500 | 85 | 17.7 |
| | 500-1000 | 143 | 29.8 |
| | 1000-1500 | 74 | 15.4 |
| | >1500 | 106 | 22.1 |
| Health insurance | Yes | 375 | 78.1 |
| | No | 105 | 21.9 |
| Response to dental/ orofacial pain | Seek dental care | 270 | 56.3 |
| | Take OTC drugs | 78 | 16.2 |
| | Home remedies | 132 | 27.5 |

3.2 Participants' Practices, Knowledge and Awareness Concerning the Use of Analgesics for Relieving Dental Pain

The majority of participants reported using analgesics one month ago 131 (27%), followed by 108 (22.5%) stating that they never used any analgesics. The greater number of participants noted that the analgesics used were prescribed by their dentist 197 (41%), while 172 (35.8%) reported using analgesics obtained without a dental prescription. The primary sources of knowledge regarding appropriate analgesic use were through the

health care practitioners, which include: physicians, dentists or pharmacists 229 (62.3%). The most used analgesic for dental pain was reported to be acetaminophen 232 (48.3%). Regarding the participants' awareness of the safety of analgesic use, a larger number indicated that some analgesics may be hazardous to use 258 (59.4%). When asked specifically about analgesic safety during breastfeeding or pregnancy, 366 (76%) of participants expressed disagreement regarding the safety of analgesics for these groups.

Concerning possible drug interaction, a larger

number stated that combining drugs can result in interactions 308 (64.2%). Over a half of the participants correctly identified that analgesics are known to cause dependence 261 (54.4%). A half of the participants, 244 (50.8%), correctly identified appropriate situations for analgesic use, reflecting adequate knowledge and proper

justifications. Additionally, a higher percentage of correct responses, 377 (78.5%), was observed when participants were asked to identify analgesic medications within a list that included both antibiotics and analgesics. Table 2 illustrates the practices and patterns of analgesic use among participants.

Table 2: Practices and patterns of analgesic use among dental patients (N= 480)

| Practices and patterns of analgesic use | Frequency (n) | Percent (%) | |
|---|--|-------------|------|
| When did you last use analgesics /painkillers for dental pain? | One month or less ago | 131 | 27.3 |
| | Six months ago | 73 | 15.2 |
| | A year ago | 74 | 15.4 |
| | over a year ago | 94 | 19.6 |
| | I never used analgesics for dental pain | 108 | 22.5 |
| Did a dentist prescribe this analgesic for you? | Yes | 197 | 41.0 |
| | No | 172 | 35.8 |
| | I never used analgesics for dental pain | 111 | 23.2 |
| What are your sources of information regarding analgesic use for dental pain? | Health care practitioners (physicians, dentists, pharmacists) | 229 | 62.3 |
| | Previous experience | 72 | 15 |
| | Family or friends | 55 | 11.2 |
| | I never used analgesics for dental pain | 54 | 11.5 |
| What types of painkillers do you most commonly use for orofacial and dental pain? | Acetaminophen (Panadol, paracetamol, Panda, Revanin) | 232 | 48.3 |
| | Hydrocodone, oxycodone, Codeine, Tramadol | 1 | .2 |
| | Pregabalin, Gabapentin, Duloxetine | 4 | .8 |
| | NSAIDs (Ibuprofen, Voltaren, Voltarol, Diclofenac Sodium) | 158 | 33 |
| | I never used analgesics for dental pain | 85 | 17.7 |
| Did you experience adverse effects while using NSAIDs (Ibuprofen, voltfast, voltarin, diclofenac sodium)? | Yes | 76 | 15.8 |
| | No | 404 | 84.2 |
| During the last year, I used analgesics for: | After extraction, post-dental treatment, abscess, cellulitis, tooth pain, and wisdom tooth pain. (Justifiable) | 244 | 50.8 |
| | prophylaxis before dental treatment, tooth sensitivity, orthodontic treatment, gingival pain, | 80 | 16.7 |
| | I did not use analgesics | 156 | 32.5 |
| All analgesics/painkillers are safe to be used | Agree | 60 | 12.5 |
| | Disagree (correct answer) | 285 | 59.4 |
| | I don't know (IDK) | 135 | 28.1 |
| All analgesics/painkillers are safe for pregnant or breastfeeding women | Agree | 9 | 1.9 |
| | Disagree (correct answer) | 366 | 76.3 |
| | IDK | 105 | 21.8 |
| Some analgesics/painkillers interact when taken together | Agree (correct answer) | 308 | 64.2 |
| | Disagree | 21 | 4.4 |
| | IDK | 151 | 31.4 |
| Which of the following are analgesic medications? | Panadol, Brufen/ Doloraz/ Voltfast (correct) | 377 | 78.5 |
| | Augmentin, Amoclan, Flagyl/Dentagyl, (incorrect) | 64 | 13.3 |
| | IDK | 39 | 8.2 |

| | | | |
|---|---|-----|------|
| Which types of analgesics cause dependence? | Codeine, Tramadol (<u>correct</u>) | 261 | 54.4 |
| | Panadol, Voltaren, Doloraz (<u>incorrect</u>) | 55 | 11.5 |
| | IDK | 164 | 34.1 |

3.3 Factors Influencing the Awareness and Knowledge of Participants Regarding the Use of Analgesics for Managing Dental Pain

Correlations were examined using chi-square tests between key sociodemographic variables (marital status, gender, age, education, employment, income, and health insurance) and categorical outcomes related to analgesic-use practices and knowledge. Specifically, the analyses compare differences in prescription status, sources of information, justification for analgesic use, experience of adverse effects, and multiple knowledge-related outcomes across sociodemographic groups to identify patterns of association.

Significant gender differences were observed across knowledge and awareness related to analgesic use for dental pain. Females demonstrated greater overall awareness than males, being more likely to reject the statement that all analgesics are safe (66.0% vs. 48.3%, $p=0.001$) and to recognize that analgesics are not universally safe during pregnancy or breastfeeding (84.7% vs. 62.2%, $p<0.001$), while males showed higher uncertainty. Females were also more aware of drug interactions (70.3% vs. 53.9%, $p=0.001$) and better at identifying analgesics (82.3% vs. 72.2%, $p=0.030$). No gender differences were found for knowledge of dependence-causing analgesics ($\chi^2=1.82$, $p=0.40$).

Marital status significantly influenced several behaviours and knowledge outcomes. Married participants were more likely to receive dentist-prescribed analgesics (49.1% vs. 34.1%, $p < 0.001$), rely more on previous personal experience (20.7% vs. 11.3%), and report justifiable use (57.2% vs. 45.3%, $p = 0.03$). Singles showed better awareness of drug interactions (70.2% vs. 57.2%, $p = 0.001$), while married participants were more accurate in identifying analgesics (83.8% vs. 74.0%, $p = 0.03$). No differences were found in knowledge of dependence-causing analgesics ($p=0.20$).

Age was associated with several variables. Older adults were more likely to receive dentist-prescribed analgesics ($p = 0.041$) and rely on personal experience, while younger adults more often consulted friends or family ($p < 0.001$). Although justifiable use did not significantly differ by age ($p = 0.10$), a positive linear

trend indicated increasing justifiable use with age ($p = 0.004$). Younger adults showed greater awareness of pregnancy-related analgesic risks ($p = 0.05$) and drug interactions ($p = 0.002$). Knowledge of analgesics and dependence-causing drugs did not differ significantly across age groups ($p > 0.05$).

Place of residence showed a marginal association with receiving dentist-prescribed analgesics ($p = 0.052$), with a significant linear trend suggesting slightly higher prescription use in rural areas ($p = 0.02$).

Education level influenced medication knowledge, but not behaviour. Information sources and reasons for analgesic use did not differ by education ($p > 0.05$). However, higher education was associated with rejecting the belief that all analgesics are safe ($p = 0.011$) and with more accurate identification of analgesics ($p = 0.01$). Awareness of dependence-causing analgesics showed a positive trend with increasing education ($p = 0.020$), despite a non-significant overall association ($p = 0.22$).

Employment status affected knowledge, but not use. Medically employed participants had significantly better awareness regarding general analgesic safety ($p < 0.001$), safety in pregnancy or breastfeeding ($p = 0.004$), drug interactions ($p = 0.002$), and analgesic identification ($p = 0.05$). Prescription patterns and justifiable use did not vary by employment ($p > 0.05$).

Income significantly influenced several outcomes. Lower-income respondents reported more NSAID adverse effects ($p = 0.03$) and irrational use (29.2%), while higher-income groups more often reported no analgesic use (42.5%, $p = 0.005$). Knowledge of analgesics increased with income ($p = 0.005$), and awareness of dependence-causing analgesics also showed a positive trend ($p = 0.03$; trend= 0.014). Beliefs about general or pregnancy-related analgesic safety did not differ significantly by income, though uncertainty was more common in lower-income groups.

Health insurance status was associated with two key knowledge outcomes. Insured participants were more likely to reject the belief that all analgesics are safe for pregnant or breastfeeding women (77.3% vs. 72.4%, $p < 0.001$) and showed better awareness of dependence-causing analgesics (56.0% vs. 48.6%, $p = 0.02$). This

suggests that insurance-and therefore greater healthcare access-supports better medication knowledge. Detailed

correlations are provided in Tables 3 and 4.

Table 3: Associations between marital status, gender, and age and analgesic knowledge, beliefs and use (n = 480)

| Sociodemographic Factor | Dependent Variable | χ^2 (df) | p-value |
|--|--|---------------|---------|
| Marital status | | | |
| Married participants relied on prescriptions | Analgesics were prescribed by a dentist or | 16.26 (2) | <0.001 |
| Married individuals relied more on personal experience | Sources of analgesic information | 14.90 (3) | 0.002 |
| Married participants reported more justifiable use | Justifiable use of analgesics | 6.82 (2) | 0.033 |
| Married individuals were less likely to believe that all analgesics are safe and were more uncertain | Belief that all analgesics are safe | 6.68 (2) | 0.035 |
| Singles showed greater awareness of drug interactions | Awareness of analgesic interactions | 13.32 (2) | 0.001 |
| Married participants demonstrated higher knowledge of analgesics | Knowledge of analgesic medications | 7.05 (2) | 0.030 |
| Gender | | | |
| Females showed greater awareness of analgesic risks | Belief that all analgesics are safe to use | 14.57 (2) | 0.001 |
| Females are more aware of medication risks in pregnancy | Belief that analgesics are safe during pregnancy/breastfeeding | 31.36 (2) | <0.001 |
| Females demonstrated higher awareness of drug interactions | Awareness that some analgesics interact | 13.24 (2) | 0.001 |
| Females correctly identified analgesics | Knowledge of analgesic medications | 7.03 (2) | 0.030 |
| Age | | | |
| Older participants were more likely to receive dental | Dentist-prescribed analgesic use | 13.13 (6) | 0.041 |
| Reliance on personal experience increased with age | Sources of analgesic information | 31.69 (9) | <0.001 |
| Younger participants showed higher awareness | Belief that analgesics are safe in pregnancy/breastfeeding | 12.79 (6) | 0.047 |
| Awareness decreased with age | Awareness of analgesic interactions | 20.40 (6) | 0.002 |

Table 4: Associations between education, employment, income and insurance and analgesic knowledge, beliefs, and use (N = 480)

| Sociodemographic Factor | Dependent Variable | χ^2 (df) | p-value |
|--|--|---------------|---------|
| Education | | | |
| Higher education was linked to greater awareness | Belief that all analgesics are safe | 13.04 (4) | 0.011 |
| Higher education was associated with better knowledge | Knowledge of analgesic medications | 12.82 (4) | 0.012 |
| Knowledge improved with increasing education | Knowledge of dependence-causing analgesics | 5.76 (4) | 0.020 |
| Employment | | | |
| Employment | Belief that all analgesics are safe | 22.65 (4) | <0.001 |
| Medical employees most aware of risks | Belief that analgesics are safe in pregnancy/breastfeeding | 15.24 (4) | 0.004 |
| Medical employees showed highest awareness | Awareness of analgesic interactions | 16.55 (4) | 0.002 |
| Medical employment was linked to greater knowledge | Knowledge of analgesic medications | 9.56 (4) | 0.049 |
| Knowledge increased with medical employment | | | |
| Income | | | |
| Income | Adverse effects from NSAIDs | 10.55 (4) | 0.032 |
| Adverse effects decreased with higher income | Justification for analgesic use | 22.16 (8) | 0.005 |
| Lower-income respondents reported more unjustifiable use | Knowledge of analgesic medications | 22.23 (8) | 0.005 |
| Middle-income participants were most knowledgeable | Knowledge of dependence-causing analgesics | 17.30 (8) | 0.027 |
| Knowledge increased with income | | | |

| Health insurance | | |
|--|--|------------------|
| Insured participants more aware of safety considerations | Belief that analgesics are safe for pregnant/breastfeeding women | 16.77 (2) <0.001 |
| Health insurance was linked to greater knowledge of dependence | Knowledge of dependence-causing analgesics | 7.71 (2) 0.021 |

4. Discussion

This study explored the practices, knowledge, and awareness of analgesic use for dental and orofacial pain among patients attending a dental teaching centre in Jordan, and examined the varied outcomes across sociodemographic groups. Overall, the sample consisted predominantly of young, urban, well-educated adults, with more than a half being unemployed, but medically insured. Within this context, several key findings emerged: (1) analgesic use for dental pain was common and largely centred on acetaminophen and non-steroidal anti-inflammatory drugs (NSAIDs); (2) most participants demonstrated generally adequate knowledge about analgesic safety, particularly in relation to pregnancy and breastfeeding, drug interactions, and drug identification; and (3) several sociodemographic factors - including gender, marital status, age, education, employment, income, and health insurance coverage - are significantly associated with knowledge, beliefs, and use of analgesics. More than three-quarters of participants reported using analgesics for dental or orofacial pain, with approximately one quarter indicating recent use within the preceding month. Acetaminophen and NSAIDs were by far the most commonly used agents, whereas opioids and adjuvant analgesics were rarely reported. This pattern is consistent with regional and international evidence, demonstrating a preference for paracetamol and ibuprofen in dental pain management (4,22,23).

In Jordan, analgesics remain among the most frequently self-medicated drug classes (15). Around a half of the participants used analgesics for appropriate, clinically justified reasons, whereas only one-sixth reported unjustifiable use. Notably, one-third did not use analgesics at all, which may reflect adequate pain tolerance, preference for non-pharmacological strategies, or limited access to OTC medications. Compared with reports from Saudi Arabia, Iran, and other countries, where self-medication for dental pain often exceeds 60% and commonly occurs without professional guidance (22,24,25), a substantial proportion of participants in the present study obtained dentist-prescribed analgesics. Nearly two-thirds

identified healthcare professionals as their main source of information, reinforcing the central role of dentists, physicians, and pharmacists in guiding analgesic use. This finding aligns with earlier Jordanian and regional studies, although informal sources, such as family and friends, continue to influence decision-making (14,15,26).

Participants demonstrated generally adequate knowledge across several domains. Most correctly rejected the notion that all analgesics are universally safe, recognised potential drug interactions, and accurately identified common analgesic medications. Awareness was particularly high regarding analgesic safety during pregnancy and breastfeeding, with over three-quarters responding correctly. Nevertheless, a notable minority remained uncertain, and a small proportion continued to perceive analgesics as inherently safe. This finding is clinically important given the documented prevalence of self-medication among pregnant women in the region and the known maternal and fetal risks associated with inappropriate paracetamol dosing or NSAID exposure (27-30). The persistence of uncertainty, even in a relatively well-educated population, underscores the need for targeted counselling on analgesic safety during pregnancy and lactation.

Knowledge regarding dependence-causing analgesics was comparatively weaker. Only slightly more than a half of the participants correctly identified codeine and tramadol as agents associated with dependence, while a substantial proportion were unsure. Similar gaps have been reported in other Middle Eastern populations, where general analgesic awareness coexists with limited understanding of opioid-related risks (31). This finding highlights the need for clearer patient education on the distinction between non-opioid and opioid analgesics and their respective risk profiles.

Sociodemographic analyses revealed meaningful variations in analgesic knowledge and behaviour. Female participants consistently demonstrated higher awareness of analgesic risks, including safety concerns, pregnancy-related issues, and drug interactions, and were more accurate in identifying analgesic

medications. This aligns with prior evidence showing that females often exhibit greater medication knowledge and safer use behaviours, possibly reflecting differences in health-seeking behaviour or exposure to health information (32).

Marital status was associated with both knowledge and practices. Married participants were more likely to report dentist-prescribed and justifiable analgesic use, suggesting greater reliance on professional care, whereas single participants showed higher awareness of drug interactions. These mixed patterns may reflect differences in health priorities, responsibilities, and information sources, as observed in other self-medication studies (15,16).

Age also influenced analgesic use and awareness. Older participants were more likely to receive dentist-prescribed analgesics and to rely on prior personal experience, while younger participants demonstrated greater awareness of drug interactions and pregnancy-related risks. Similar age-related trends have been reported in Jordan and neighbouring countries, where younger adults often have greater exposure to digital health information, but also engage more frequently in informal self-medication (15,26). The tendency toward more justifiable analgesic use with increasing age may reflect cumulative healthcare experience and repeated professional contact.

Education emerged as an important determinant of knowledge, but not of use patterns. Participants with higher educational attainment showed greater awareness of analgesic safety and were more accurate in identifying analgesic medications, consistent with established links between education, health literacy, and medication knowledge (33,34). However, education had limited influence on reasons for use or primary information sources, suggesting that formal education alone may be insufficient to correct specific misconceptions related to analgesic use. Employment status, particularly employment in the medical field, was strongly associated with higher knowledge across multiple domains, including safety, pregnancy-related risks, drug interactions, and medication identification. This is consistent with previous studies indicating that health professionals and health-related students generally possess better analgesic knowledge, although gaps may still exist (35). Income and health insurance coverage also played significant roles: lower-income participants reported more NSAID-related adverse

effects and higher rates of unjustifiable use (15,16,24), whereas insured participants demonstrated better knowledge of safety and dependence-related risks (27,36). These findings mirror regional evidence linking socioeconomic disadvantage and limited healthcare access to higher self-medication and poorer medication literacy.

From a clinical perspective, these findings support the integration of routine, brief analgesic counselling into dental practice, particularly for males, younger adults, and lower-income patients who demonstrated lower awareness or higher rates of inappropriate use. Dentists and pharmacists are well positioned to reinforce appropriate indications, dosing, potential interactions, and risks associated with NSAIDs and opioid-containing analgesics, with particular attention to pregnancy and breastfeeding. Incorporating structured medication-history taking and targeted patient education into routine dental care may help reduce inappropriate self-medication and prevent avoidable adverse effects, especially in settings where over-the-counter access to analgesics is widespread (8,37).

Limitations of this study include its reliance on self-reported survey responses, which may be subject to recall bias or social desirability. Moreover, although the sample size was reasonable, more diverse recruitment across different dental centres may enhance generalisability. Finally, while significant associations were identified, future research may benefit from exploring mediating factors (such as health literacy, pain history, and healthcare provider interaction) using longitudinal designs.

5. Conclusions

Patients attending a dental teaching centre in northern Jordan commonly use analgesics for dental pain and, overall, show reasonably good awareness of basic safety issues, including pregnancy-related risks, drug interactions, and correct identification of common analgesics. However, knowledge is uneven: lower-income, less-educated, non-medical, and uninsured participants are more likely to report irrational use, adverse effects, and misconceptions, particularly around pregnancy and dependence.

These findings highlight the need for targeted education on safe analgesic use, especially for vulnerable groups. Dentists and pharmacists, as key points of contact for pain management, should routinely

provide clear counselling on appropriate indications, dosing, interactions, and special precautions in pregnancy and breastfeeding to promote safer and more rational use of analgesics in dental care.

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Conflict of interests

The authors have no conflict of interests to declare.

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